Tropentag, September 20-22, 2023, hybrid conference

"Competing pathways for equitable food systems transformation: Trade-offs and synergies"

Nutritional enhancement of Kenyan porridges: Chia seed and oyster mushroom fortification

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Abstract

The CHIAM project is an ambitious initiative that seeks to develop a climate-smart solution for sustainable food systems in Africa, addressing the complex challenges presented by the Food Systems and Climate (FOSC) call. To achieve this, the project emphasises the introduction of innovative agricultural technologies and the comprehensive redesign of the existing African agri-food value chain. This approach is aimed at substantially increasing resilience, sustainability, and circularity in the region's food systems. A key component is the implementation of a chia-mushroom-pig biogas value chain, which plays a crucial role in diversifying and strengthening the resilience of African food systems in the face of climate change impacts. In collaboration with the main CHIAM project, the project partner in Germany is working on fortifying local staple foods with chia seeds and oyster mushrooms, with an aim of providing essential nutrients to the local communities. To assess the potential benefits of this fortification, traditional Kenyan porridges made from white maize, sorghum, and pearl millet are being examined for improvements in nutritional quality and technological effects. Researchers are employing various analytical tools, such as the Rapid Visco Analyzer (RVA), rheological measurements, and texture profile analysis, to determine the impacts of the cereal substitution on the porridges. Porridge recipes consist of one part maize, sorghum, or pearl millet flour, combined with two or four-fifths parts water, resulting in thick or thin porridge, respectively. Substitution levels of 3 %, 6 %, and 9 % of the cereals are being tested with ground chia seeds or oyster mushrooms, as well as combinations for thick porridge. Preliminary findings indicate that when maize flour is replaced with increasing amounts of oyster mushrooms, the peak viscosity, as measured by RVA, is reduced. In contrast, incorporating higher amounts of chia seeds into the porridge recipes results in increased viscosity and strength, even though the values remain below standard levels. These observations suggest that a higher chia seed content leads to an increased water-binding capacity within the porridge, potentially improving its overall quality. More experiments are currently ongoing, and more comprehensive results will be presented at the upcoming conference.

Keywords: Chia, nutritional enhancement, oyster mushroom, porridge

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